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SUGHRUE MION, PLLC				
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EXAMINER				
BOYLE, ROBERT C				
ART UNIT		PAPER NUMBER		
1796				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/571,317

Applicant(s)

HONDA ET AL.

Examiner

ROBERT C. BOYLE

Art Unit

1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 April 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) 1-8 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/CD)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(c), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(c) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/8/2010 has been entered.
2. It is noted that an interview was held with Abraham Rosner on 3/3/2010, made part of the Image File Wrapper on 3/11/2010. During the interview, Applicant explained the IR discussion in Curtin in that the 1740 cm⁻¹ bands are due to by-products and not attributable to the carboxyl groups on the polymer. It was questioned whether the carboxyl groups referred to in claim 9 were due to end groups or carboxyl groups throughout the polymer chain.

Claim Rejections - 35 USC § 103

3. Claims 9, 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Curtin** (US 6,150,426) in view of **Schreyer** (US 3,085,083).
4. As to claims 9, 12-13, Curtin teaches copolymers of tetrafluoroethylene ("TFE") and a perfluorinated vinyl ether CF₂=CF-O-CF₂CF₂SO₂F ("B") (column 3, lines 49-63; column 4, lines 22-50). Curtin does not teach the IR intensity ratio of main chain terminal carboxyl groups and -CF₂- peaks.
5. However, Schreyer teaches stabilized fluoropolymers with -CF₂H endgroups (col. 2, ln. 24-72) and has substantially complete removal of the carboxylate endgroups (col. 6, ln. 20-22). It

would have been obvious to one of ordinary skill in the art to modify the fluoropolymer in Curtin with the number of fluorinated methyl end-groups taught in Schreyer because Curtin teaches perfluorinated polymers with no C-H bonds and low equivalent weights with high ion exchange ratios which correspond to lower molecular weights (Curtin: column 3, lines 49-63; column 4, lines 22-67; column 5, lines 1-14; column 6, lines 49-65) and Schreyer teaches additional fluorinated methyl end-groups add stability and give improved corrosion resistance (Schreyer: column 1, line 15-column 2, line 72; table IV). It would have been obvious to one of ordinary skill in the art that fluoropolymers having the substantially complete removal of the carboxylate endgroups would have an IR intensity ratio of main chain terminal carboxyl groups and $-\text{CF}_2-$ peaks of zero because there are substantially no carboxylate endgroups present.

6. It is noted that claims 9-13 are recited in the product-by-process format by use of the language, "A stabilized fluoropolymer obtained via polymerization..." Case law holds that:

Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. See *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

7. To the extent that the process limitations in a product-by-process claim do not carry weight absent a showing of criticality, the reference discloses the claimed product in the sense that the prior art product structure is seen to be no different from that indicated in the claims. It is noted that claims 12-13 add no structural differences to the fluoropolymer of claim 9, but rather merely recite further process steps of the product by process recitation. Thus, the fluoropolymers of the prior art satisfy the limitations of claims 12-13.

8. Curtin and Schreyer do not teach the melt index claimed. However, Curtin and Schreyer teach essentially the same fluoropolymer and process as that of the claimed, and one of ordinary skill in the art would have a reasonable basis to believe the fluoropolymer of Curtin and Schreyer exhibits essentially the same properties. Since the PTO cannot conduct experiments, the burden of proof is shifted to the applicants to establish an unobvious difference. See *In re Best*, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977). For the above reasons, the instantly claimed fluoropolymer is rendered obvious over the combined disclosures of Curtin and Schreyer.

9. Claims 9, 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Curtin** (US 6,150,426) in view of **Carlson** (US 4,599,386).

10. As to claims 9, 12-13, Curtin teaches copolymers of tetrafluoroethylene ("TFE") and a perfluorinated vinyl ether $\text{CF}_2=\text{CF}-\text{O}-\text{CF}_2\text{CF}_2\text{SO}_2\text{F}$ ("B") (column 3, lines 49-63; column 4, lines 22-50). Curtin does not teach the IR intensity ratio of main chain terminal carboxyl groups and $-\text{CF}_2-$ peaks.

11. Carlson teaches replacing the heat unstable carbinol and carboxyl end groups into amide groups (abstract; col. 2, ln. 16-51). Note that the polymers of Carlson have a ratio of $-\text{CO}_2\text{H}$ endgroups/ 10^6 C of zero (col. 5, ln. 20-28). It would have been obvious to one of ordinary skill in the art to modify the fluoropolymer in Curtin with the endgroups of Carlson because the amide end groups has enhanced propensity against heat degradation (col. 2, ln. 5-10). It would have been obvious to one of ordinary skill in the art that fluoropolymers having the no carboxylate endgroups would have an IR intensity ratio of main chain terminal carboxyl groups and $-\text{CF}_2-$ peaks of zero because there are no carboxylate endgroups present.

12. It is noted that claims 9-13 are recited in the product-by-process format by use of the language, "A stabilized fluoropolymer obtained via polymerization..." Case law holds that:

Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. See *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

13. To the extent that the process limitations in a product-by-process claim do not carry weight absent a showing of criticality, the reference discloses the claimed product in the sense that the prior art product structure is seen to be no different from that indicated in the claims. It is noted that claims 12-13 add no structural differences to the fluoropolymer of claim 9, but rather merely recite further process steps of the product by process recitation. Thus, the fluoropolymers of the prior art satisfy the limitations of claims 12-13.

14. Curtin and Carlson do not teach the melt index claimed. However, Curtin and Carlson teach essentially the same fluoropolymer and process as that of the claimed, and one of ordinary skill in the art would have a reasonable basis to believe the fluoropolymer of Curtin and Carlson exhibits essentially the same properties. Since the PTO cannot conduct experiments, the burden of proof is shifted to the applicants to establish an unobvious difference. See *In re Best*, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977). For the above reasons, the instantly claimed fluoropolymer is rendered obvious over the combined disclosures of Curtin and Carlson.

15. Claims 9-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Curtin** (US 6,150,426) in view of **GB 1,210,794** ("GB '794").

16. As to claims 9-13, Curtin teaches copolymers of tetrafluoroethylene ("TFE") and a perfluorinated vinyl ether $\text{CF}_2=\text{CF}-\text{O}-\text{CF}_2\text{CF}_2\text{SO}_2\text{F}$ ("B") (column 3, lines 49-63; column 4, lines 22-50). Curtin does not teach the IR intensity ratio of main chain terminal carboxyl groups and $-\text{CF}_2-$ peaks or the number of $-\text{CF}_3$ groups.

17. GB '794 teaches the stabilization of fluoropolymers containing pendent $-\text{SO}_2\text{F}$ groups (pg. 1, ln. 45-61; pg. 3, ln 112-pg. 4, ln. 28) where the end groups are converted into $-\text{CF}_3$ groups by fluorination (pg. 2, ln. 11-20) such that no carboxyl groups are detected via IR after fluorination (Table I) and the molecular weight of the polymers is at least 10,000 (pg. 2, ln. 49-52). It would have been obvious to one of ordinary skill in the art to modify the endgroups of the polymers of Curtin with the $-\text{CF}_3$ groups of GB '794 because GB '749 teaches the $-\text{CF}_3$ groups improve the stability of the polymer (pg. 1, ln. 45-49) and make any fuel cell membranes formed from the fluoropolymer more resistant to the hydroxyl radical that is believed to be present and which degrades the membrane (pg. 3, ln. 38-51).

18. It would have been obvious to one of ordinary skill in the art that fluoropolymers where all the endgroups have been converted to the $-\text{CF}_3$ groups and having a molecular weight of at least 10,000 would result in a ratio of $-\text{CF}_3$ groups per main chain carbon atoms that overlaps the claimed range of not smaller than $10 \text{ per } 10^5$. To derive the number of main chain carbon atoms in the fluoropolymers of GB '794, the polymeric molecular weight (10,000) is divided by the molecular weight of each carbon unit ($-\text{CF}_2-$) which is 50. Thus, 10,000 divided by 50 gives a result of 200 main chain carbon atoms. A fluoropolymer with a $-\text{CF}_3$ group on each end (2 $-\text{CF}_3$ groups per polymer) would result in a ratio of 2 $-\text{CF}_3$ groups per 200 main chain carbon atoms.

This value falls within the claimed range of greater than 10 -CF₃ groups per 10⁵ main chain carbon atoms.

19. It is noted that claims 9-13 are recited in the product-by-process format by use of the language, "A stabilized fluoropolymer obtained via polymerization..." Case law holds that:

Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. See *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

20. To the extent that the process limitations in a product-by-process claim do not carry weight absent a showing of criticality, the reference discloses the claimed product in the sense that the prior art product structure is seen to be no different from that indicated in the claims. It is noted that claims 12-13 add no structural differences to the fluoropolymer of claim 9, but rather merely recite further process steps of the product by process recitation. Thus, the fluoropolymers of the prior art satisfy the limitations of claims 12-13.

21. Curtin and GB '794 do not teach the melt index claimed. However, Curtin and GB '794 teach essentially the same fluoropolymer and process as that of the claimed, and one of ordinary skill in the art would have a reasonable basis to believe the fluoropolymer of Curtin and GB '794 exhibits essentially the same properties. Since the PTO cannot conduct experiments, the burden of proof is shifted to the applicants to establish an unobvious difference. See *In re Best*, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977). For the above reasons, the instantly claimed fluoropolymer is rendered obvious over the combined disclosures of Curtin and GB '794.

22. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Curtin** (US 6,150,426) in view of **GB 1,210,794** (“GB ‘794”) and **Kaulbach** (WO 02/077046). The discussion with respect to Curtin and GB ‘794 as set forth in paragraphs 15-21 above is incorporated here by reference.

23. As to claim 12, Curtin teaches copolymers of tetrafluoroethylene (“TFE”) and a perfluorinated vinyl ether $\text{CF}_2=\text{CF}-\text{O}-\text{CF}_2\text{CF}_2\text{SO}_2\text{F}$ (“B”) (column 3, lines 49-63; column 4, lines 22-50). GB ‘794 teaches the stabilization of fluoropolymers containing pendent $-\text{SO}_2\text{F}$ groups (pg. 1, ln. 45-61; pg. 3, ln 112-pg. 4, ln. 28) where the end groups are converted into $-\text{CF}_3$ groups by fluorination (pg. 2, ln. 11-20) such that no carboxyl groups are detected via IR after fluorination (Table I) and the molecular weight of the polymers is at least 10,000 (pg. 2, ln. 49-52). Curtin and GB ‘794 do not teach emulsion polymerization.

24. Kaulbach teaches the formation of fluoropolymers through emulsion polymerization (abstract). It would have been obvious to use the emulsion polymerization of Kaulbach because it allows for an improvement of the efficiency of an aqueous emulsion polymerization process, particularly, reduction of polymerization time and improved polymer yield (Kaulbach: abstract).

Response to Arguments

25. Applicant’s arguments with respect to the 102/103 rejection over Curtin have been fully considered and are persuasive. The 102/103 rejection over Curtin has been withdrawn.

26. Applicant’s arguments with respect to the obviousness rejection over Curtin in view of Schreyer regarding claim 10 is persuasive because Schreyer does not teach $-\text{CF}_3$ endgroups or how to form a $-\text{CF}_3$ endgroup. Therefore, the obviousness rejection of claims 10-11 are

withdrawn. However, this does not preclude the use of Curtin or Schreyer in further rejections as they are still relevant art. Notably, see the above rejections.

27. Applicant's arguments with respect to Curtin in view of Schreyer are not persuasive as to claim 9 because claim 9 does not contain a limitation specifying a $-CF_3$ endgroup. Thus, the endgroups taught in Schreyer ($-CF_2H$) satisfy the limitations of claim 9.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT C. BOYLE whose telephone number is (571)270-7347. The examiner can normally be reached on Monday-Thursday, 9:00AM-5:00PM Eastern.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571)272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Robert C. Boyle/
Examiner, Art Unit 1796

/Vasu Jagannathan/
Supervisory Patent Examiner, Art Unit 1796